

**EPA Superfund
Record of Decision:**

**OAK RIDGE RESERVATION (USDOE)
EPA ID: TN1890090003
OU 04
OAK RIDGE, TN
09/19/1991**

- DEWATERING OF THE RAW SLUDGES AND REPACKAGING THEM INTO COMPATIBLE CONTAINERS;
- DECANTING THE FREE LIQUIDS FROM THE STABILIZED SLUDGE DRUMS;
- INSPECT THE STABILIZED SLUDGE DRUMS AND REPAIR OR OVERPACK THEM AS REQUIRED;
- TREAT ALL LIQUIDS THROUGH EXISTING TREATMENT FACILITIES;
- MOVE ALL THE CONTAINERS INTO NEW AND EXISTING INDOOR STORAGE FACILITIES;

THE COST FOR THIS INTERIM ACTION REMEDY IS \$69 MILLION.

STATUTORY DETERMINATIONS

THIS INTERIM ACTION IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, COMPLIES WITH FEDERAL AND STATE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THIS LIMITED-SCOPE ACTION, AND IS COST EFFECTIVE. THIS ACTION IS INTERIM AND IS NOT INTENDED TO UTILIZE PERMANENCE SOLUTIONS AND ALTERNATIVE TREATMENT (OR RESOURCE RECOVERY) TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE, GIVEN THE LIMITED SCOPE OF THE ACTION. BECAUSE THIS ACTION DOES NOT CONSTITUTE THE FINAL REMEDY FOR THE SITE, THE STATUTORY PREFERENCE FOR REMEDIES THAT EMPLOY TREATMENT THAT REDUCES TOXICITY, MOBILITY, OR VOLUME AS A PRINCIPAL ELEMENT WILL BE ADDRESSED AT THE TIME OF THE FINAL RESPONSE ACTION. BECAUSE THIS IS AN INTERIM ACTION, SUBSEQUENT ACTIONS ARE PLANNED TO ADDRESS FULLY THE PRINCIPAL THREATS POSED BY THE CONDITIONS AT WAG 1 AND THESE WILL BE DEFINED WHEN THE REMEDIAL INVESTIGATION OF THIS AREA IS COMPLETED.

MANAGER, FIELD OFFICE OAK RIDGE	9/30/91
SITE NAME, LOCATION, AND DESCRIPTION	DATE

REGIONAL ADMINISTRATOR, REGION IV	9/19/91
US ENVIRONMENTAL PROTECTION AGENCY	DATE

DIRECTOR, DOE OVERSIGHT DIVISION	9/23/91
STATE OF TENNESSEE	DATE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION	

#SNLD

1. SITE NAME, LOCATION, AND DESCRIPTION

THE OAK RIDGE K-25 SITE IS PART OF THE OAK RIDGE RESERVATION (ORR) SUPERFUND SITE. THE SITE IS LOCATED APPROXIMATELY FIVE MILES FROM THE RESIDENTIAL AREAS OF THE CITY OF OAK RIDGE, NEAR THE CONFLUENCE OF POPLAR CREEK AND THE CLINCH RIVER. IT OCCUPIES APPROXIMATELY 1700 ACRES OF LAND WITH APPROXIMATELY 700 ACRES ENCLOSED WITHIN THE SECURITY FENCE.

THE K-1417-A AND K-1417-B DSYS AND K-1419 STF (HEREIN TO BE REFERRED TO COLLECTIVELY AS THE DSYS) ARE LOCATED IN THE NORTHEASTERN PORTION OF THE K-25 SITE IN OAK RIDGE, TENNESSEE (FIGURES 1 - 3). THE STORAGE YARDS CONSIST OF TWO ADJACENT ASPHALT PADS COVERING APPROXIMATELY SIX ACRES ON THE NORTH SIDE OF MITCHELL BRANCH, A SMALL STREAM WHICH DRAINS INTO POPLAR CREEK. EACH STORAGE YARD IS SLOPED GENTLY TOWARD THE SOUTH AND THE SOUTHERN BOUNDARY OF THE YARD, ALONG MOST OF ITS LENGTH, HAS A SIX INCH CURB. THIS CURB DIRECTS PRECIPITATION RUN-OFF TO A CATCH BASIN FOR EACH YARD. RUN-OFF ENTERING THE BASINS IS THEN DISCHARGED TO MITCHELL BRANCH.

#SHEA

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

THE K-25 SITE WAS CONSTRUCTED IN THE 1940'S FOR THE SEPARATION OF URANIUM ISOTOPES BY THE GASEOUS DIFFUSION PROCESS. THE K-1407-B POND WAS CONSTRUCTED IN 1943 TO COLLECT METAL HYDROXIDE SLUDGES AND OTHER SOLIDS FROM VARIOUS OPERATIONS AT THE K-25 SITE. THE K-1407-C POND WAS CONSTRUCTED TO COLLECT POTASSIUM HYDROXIDE SCRUBBER SLUDGES AND TO HOLD THE SLUDGES REMOVED FROM THE K-1407-B POND.

THE YARDS WERE CONSTRUCTED TO TEMPORARILY STORE THE SLUDGES REMOVED DURING CLOSURE OF THE K-1407-B AND K-1407-C PONDS FOLLOWING THEIR TREATMENT IN THE K-1419 STF. THE DSYS WERE CONSTRUCTED AS PART OF A RCRA CHANGE TO INTERIM STATUS FOR THE K-25 SITE, WITH THE PART A APPLICATION SUBMITTED IN 6/29/84 AND CONCURRENCE BY THE TDEC ON 2/4/86. THE TDEC AND EPA ISSUED THE HSWA PERMIT FOR THE OAK RIDGE RESERVATION IN OCTOBER 1985, WHICH REQUIRED REMEDIAL ACTIONS TO BE TAKEN TO CORRECT ANY RELEASES AT SOLID WASTE MANAGEMENT UNITS (SWMUS) ON THE RESERVATION. THIS INCLUDED THE K-1417 DSYS. SUBSEQUENTLY, IN DECEMBER 1989 THE ENTIRE OAK RIDGE RESERVATION, WHICH INCLUDES THE K-25 SITE AND K-1417 DSYS, WAS PLACED ON THE CERCLA NATIONAL PRIORITIES LIST (NPL).

THE SLUDGES WERE REMOVED AND TREATED PURSUANT TO THE RCRA CLOSURE PLANS WHICH WERE APPROVED IN APRIL 1988. FROM FEBRUARY 1987 THROUGH SEPTEMBER 1988 SLUDGES WERE REMOVED FROM THE K-1407 8&C PONDS, STABILIZED AT THE STF, PLACED INTO DRUMS, AND STORED ON THE X-1417 DSYS. TREATMENT CONSISTED OF MIXING THE SLUDGES WITH CEMENT AND FLYASH TO FORM A NON-LEACHABLE MONOLITH. FROM SEPTEMBER 1988 THROUGH JUNE 1989 THE SLUDGES WERE REMOVED FROM THE PONDS AND PLACED DIRECTLY INTO DRUMS AND MOVED TO THE STORAGE YARDS. THESE SLUDGES WERE TO BE TREATED DURING THE FOLLOWING FISCAL YEAR.

THE SLUDGES REMOVED FROM THE PONDS ARE CLASSIFIED AS MIXED WASTES. MIXED WASTES CONTAIN A HAZARDOUS COMPONENT REGULATED UNDER SUBTITLE C OF RCRA AND A RADIOACTIVE WASTE COMPONENT REGULATED UNDER THE ATOMIC ENERGY ACT. THUS, THE DSYS ARE RCRA-REGULATED CONTAINER STORAGE AREAS.

AT THE TIME THE PONDS WERE UNDERGOING CLOSURE, DOE HAD EXPECTED TO OBTAIN EPA APPROVAL TO RECLASSIFY THE TREATED SLUDGE AS NON-HAZARDOUS, AND THEN DISPOSE OF IT AS LOW-LEVEL RADIOACTIVE WASTE. THEREFORE, THE K-1417 DSYS WERE DESIGNED TO BE A TEMPORARY STORAGE FACILITY (1-2 YEARS FOR STABILIZED DRUMS AND 6 MONTHS FOR UNSTABILIZED DRUMS). SUBSEQUENTLY, IT BECAME APPARENT THAT THERE WERE SOME QUALITY CONTROL PROBLEMS WITH THE TREATMENT PROCESS. AS SUCH, THE DOE DID

NOT COMPLETE THE TREATMENT OF DRUMMED UNTREATED SLUDGE. THE TREATED SLUDGE ALSO HAS NOT YET BEEN RECLASSIFIED AS NON-HAZARDOUS. AS A RESULT, THE SLUDGE REMAINS CLASSIFIED AS A MIXED (RADIOACTIVE/HAZARDOUS) WASTE, AND DOE HAS CONTINUED TO STORE THIS MATERIAL DUE TO A NATIONWIDE SHORTAGE OF MIXED WASTE DISPOSAL CAPACITY.

THE DRUMS ARE STACKED TWO OR THREE HIGH, IN ROWS OF UP TO FOUR DRUMS ABREAST. THIS ARRANGEMENT DOES NOT ALLOW FOR INSPECTION OF THE DRUMS AS REQUIRED BY RCRA. DUE TO THE PRESENCE OF HIGH PH LIQUIDS AND HALOGENS IN SOME OF THE DRUMS, THE STEEL DRUMS BEGAN TO DETERIORATE AND HAVE DEVELOPED PINHOLE LEAKS WHICH HAVE RELEASED SMALL QUANTITIES OF LIQUIDS TO THE PAD. ADDITIONALLY THE DRUMS ARE DETERIORATING FROM EXPOSURE TO THE ELEMENTS AND THE WEIGHT OF THE DRUMS ARE CAUSING THEM TO SINK INTO THE ASPHALT PAD. CONSEQUENTLY, THE STACKED DRUMS ARE STARTING TO LEAN AND HAVE BECOME UNSTABLE. CONDITIONS HAVE WORSENERED TO THE POINT THAT IT WAS NO LONGER SAFE FOR EMPLOYEES TO ENTER THE DSYS TO INSPECT THE CONDITION OF THE DRUMS AS REQUIRED BY RCRA. THIS, ALONG WITH THE DETERIORATED CONDITION OF THE DRUMS, COULD LEAD TO THE DRUMS TOPPLING OVER AND INJURING SITE WORKERS AND ALSO RELEASING SIGNIFICANT AMOUNTS OF HAZARDOUS WASTE.

THE ABOVE PROBLEMS WERE BROUGHT TO THE ATTENTION OF THE REGULATORS (EPA AND TDEC). IN AUGUST 1990, THE EPA AND TDEC SENT A LETTER TO DOE REQUESTING AN ACTION PLAN TO CORRECT THE RCRA VIOLATIONS AT THE K-1417 DSYS AND TO ABATE, PREVENT, OR ELIMINATE THE THREAT TO HUMAN HEALTH OR THE ENVIRONMENT DUE TO THE LEAKING DRUMS AT THE STORAGE YARDS. THE REQUESTED ACTION PLAN WAS SUBMITTED TO THE EPA AND TDEC ON JANUARY 31, 1991 AND WAS ACCEPTED BY THE REGULATORS ON MARCH 18, 1991. IT WAS ALSO RECOGNIZED THAT THE K-1417 DSYS WERE A SUITABLE SITE FOR AN INTERIM ACTION RECORD OF DECISION (ROD) UNDER CERCLA.

#HCP

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

THE INTERIM ACTION PROPOSED PLAN FOR THE K-1417-A AND K-1417-B DRUM STORAGE YARDS AT THE OAK RIDGE K-25 SITE WAS RELEASED TO THE PUBLIC ON AUGUST 16, 1991. THIS DOCUMENT WAS MADE AVAILABLE IN THE ADMINISTRATIVE RECORD MAINTAINED AT THE DOE INFORMATION RESOURCE CENTER LOCATED AT 105 BROADWAY IN OAK RIDGE. THE NOTICE OF AVAILABILITY WAS PUBLISHED THE OAK RIDGER ON AUGUST 16, 1991. A PUBLIC COMMENT PERIOD WAS HELD FROM AUGUST 16, 1991 TO SEPTEMBER 16, 1991. IN ADDITION TO PUBLIC COMMENT AND THE ACCESSIBILITY OF THE INFORMATION, A PUBLIC MEETING WAS HELD ON SEPTEMBER 9, 1991. AT THIS SESSION, REPRESENTATIVES FROM DOE AND MARTIN MARIETTA ENERGY SYSTEMS, INC. ANSWERED QUESTIONS AND RECEIVED COMMENTS. A RESPONSE TO THE COMMENTS RECEIVED DURING THE COMMENT PERIOD IS INCLUDED IN THE RESPONSIVE SUMMARY, APPENDIX A OF THIS INTERIM ROD.

THIS DECISION DOCUMENT PRESENTS THE SELECTED INTERIM ACTION FOR THE K-1417-A AND K-1417-B DRUM STORAGE YARDS (DSY) AND THE K-1419 SLUDGE TREATMENT FACILITY (STF) AT THE OAK RIDGE K-25 SITE, IN OAK RIDGE, TENNESSEE. THIS ACTION WAS CHOSEN IN ACCORDANCE WITH CERCLA, AS AMENDED BY SARA AND, TO THE EXTENT PRACTICABLE, THE NCP. THIS DECISION IS BASED ON THE ADMINISTRATIVE RECORD AND INDICATIONS OF A CURRENT OR POTENTIAL THREAT TO HUMAN HEALTH OR THE ENVIRONMENT.

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4. SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

THE GOAL OF THIS INTERIM ACTION IS TO PREVENT OR MITIGATE THE IMMINENT THREAT OF RELEASE OF CONTAMINANTS TO THE SURROUNDING ENVIRONMENT AND TO MINIMIZE THE THREAT TO HUMAN HEALTH. AN ADDITIONAL GOAL OF THIS INTERIM ACTION IS TO ASSURE THAT THE SLUDGES ARE MANAGED IN COMPLIANCE WITH THE REQUIREMENTS OF RCRA. THIS ACTION IS INTENDED TO ONLY ADDRESS THE RAW AND STABILIZED SLUDGES AT THE DSYS. IT WILL ALSO ENHANCE THE ABILITY TO INVESTIGATE AND REMEDIATE THE ENTIRE AREA AT THE DSYS.

THE POTENTIAL EXISTS FOR THE DSYS TO IMPACT THE AQUATIC LIFE IN MITCHELL BRANCH SHOULD THE DRUMS BE ALLOWED TO DETERIORATE TO THE POINT THAT THEIR IS A MAJOR RELEASE OF MATERIAL. THE PRINCIPAL THREAT TO HUMAN HEALTH IS FOR AN INJURY TO THE SITE WORKERS PERFORMING ROUTINE INSPECTION AND MAINTENANCE DUTIES IN THE YARD RESULTING FROM THE DRUMS TOPPLING OVER. REMOVAL OF THE LIQUIDS FROM THE SLUDGES, REPAIR OF THE STABILIZED SLUDGE DRUMS, AND REMOVAL OF ALL THE DRUMS FROM THE DSYS WILL ADDRESS ALL THE CONCERNS AT THE SITE.

THE K-1417 DSYS ARE ONE OF FIFTEEN SOLID WASTE MANAGEMENT UNITS THAT COMPRISE WASTE AREA GROUPING (WAG) 1 AT THE K-25 SITE. THE PROPOSED INTERIM ACTION FOR THE K-1417 DSYS IS NOT THE FINAL ACTION PLANNED FOR WAG 1, HOWEVER IT IS CONSISTENT WITH ANY POTENTIAL FINAL ACTION FOR WAG 1. SUBSEQUENT ACTIONS ARE PLANNED TO ADDRESS FULLY THE PRINCIPAL THREATS POSED BY THE CONDITIONS AT WAG 1 AND OTHER IDENTIFIED WAGS A K-25. THESE ACTIONS WILL BE DEFINED AS THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDIES ARE COMPLETED FOR THE K-25 WAGS.

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5. SITE CHARACTERISTICS

THE K-1417-A AND K-1417-B DSYS AND K-1419 STF (HEREIN TO BE REFERRED TO COLLECTIVELY AS THE DSYS) ARE LOCATED IN THE NORTHEASTERN PORTION OF THE K-25 SITE IN OAK RIDGE, TENNESSEE (FIGURES 1 - 3). THE STORAGE YARDS CONSIST OF TWO ADJACENT ASPHALT PADS COVERING APPROXIMATELY SIX ACRES ON THE NORTH SIDE OF MITCHELL BRANCH, A SMALL STREAM WHICH DRAINS INTO POPLAR CREEK. EACH STORAGE YARD IS SLOPED GENTLY TOWARD THE SOUTH AND THE SOUTHERN BOUNDARY OF THE YARD, ALONG MOST OF ITS LENGTH, HAS A SIX INCH CURB. ALL RUNOFF FROM THE DSYS EVENTUALLY FLOWS INTO MITCHELL BRANCH.

THE DSYS HAVE ABOUT 65,000 DRUMS ON THEM; 36,000 OF WHICH CONTAIN STABILIZED SLUDGES AND 29,000 OF WHICH CONTAIN RAW SLUDGES. EACH DRUM CONTAINS ABOUT 90 GALLONS OF SLUDGE. IN ADDITION THERE IS ABOUT 16,000 GALLONS OF RAW SLUDGE STORED IN TANKS AT THE STF. THE SLUDGES CONTAIN MATERIALS GENERATED FROM THE TREATMENT OF PLATING BATHS, THEREFORE THE SLUDGES ARE LISTED AS F-006 WASTES UNDER RCRA. THE SLUDGES ALSO CONTAIN RADIONUCLIDES, PRIMARILY URANIUM AND TECHNETIUM, MAKING THEM A MIXED WASTE (A WASTE THAT CONTAINS BOTH A HAZARDOUS AND RADIOACTIVE WASTE COMPONENT).

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6. SUMMARY OF SITE RISKS

CERCLA DIRECTS THAT HUMAN HEALTH AND THE ENVIRONMENT MUST BE PROTECTED FROM CURRENT AND POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES AT SUPERFUND SITES. IN ORDER TO ASSESS THE CURRENT AND POTENTIAL RISKS FOR THE K-25 SITE, A FULL RISK ASSESSMENT IS BEING CONDUCTED AS PART OF THE RI/FS PROCESS.

THE PRINCIPAL THREATS POSED BY CONDITIONS AT THE DSYS ARE INJURY OF WORKERS PERFORMING ROUTINE INSPECTION AND MAINTENANCE DUTIES, AND CONTAMINATION OF SURFACE WATER, AND POSSIBLY GROUNDWATER, BY THE CHRONIC AND/OR CATASTROPHIC RELEASE OF DRUM CONTENTS. THERE ARE TWO PRIMARY RELEASE SCENARIOS FOR THE DRUMMED SLUDGES. THE FIRST IS LEAKAGE OF FREE LIQUIDS THROUGH HOLES IN THE DRUMS CAUSED BY CORROSION. THE SECOND IS THROUGH CATASTROPHIC FAILURE OF THE DRUMS EITHER THROUGH DETERIORATION OR FROM THE STACKED DRUMS FALLING. IN EITHER CASE, THE PRIMARY EXPOSURE PATHWAY IS RAINWATER RUN-OFF CARRYING THE CONTAMINANTS INTO TO MITCHELL BRANCH WITH THE POTENTIAL TO ADVERSELY IMPACT AQUATIC ORGANISMS. THE SECOND POSSIBLE, THOUGH MINOR, PATHWAY IS FOR THE CONTAMINANTS TO INFILTRATE THROUGH THE ASPHALT PAD INTO THE SOILS BENEATH THE PADS AND EVENTUALLY INTO THE GROUNDWATER. THE PRINCIPLE THREATS TO SITE WORKERS IS THROUGH DIRECT EXPOSURE TO THE MATERIAL THROUGH SPILLS AND INJURY DUE TO FALLING DRUMS.

ANALYSIS OF STORM WATER RUN-OFF FROM THE STORAGE YARDS AS WELL AS SOIL AND SEDIMENT SAMPLES TAKEN FROM MITCHELL BRANCH HAS NOT INDICATED ANY MIGRATION OF CONTAMINANTS FROM THE K-1417 DSYS. THE ONLY CONTAMINATED MEDIA AT THE K-1417 DSYS ARE THE DRUMMED SLUDGES WHICH CONTAIN LOW LEVELS OF HEAVY METALS (SUCH AS NICKEL) AND RADIONUCLIDES, PRINCIPALLY URANIUM AND TECHNETIUM.

#DRA

7. DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

7.1 ALTERNATIVE 1: NO ACTION

THE NCP REQUIRES THAT THE NO ACTION ALTERNATIVE BE CONSIDERED THROUGH THE DETAILED ANALYSIS. IT PROVIDES A BASELINE FOR COMPARISON OF THE OTHER ALTERNATIVES. THIS ALTERNATIVE INVOLVES LEAVING THE DRUMMED SLUDGES ON THE SITE AS THEY ARE PRESENTLY SITUATED. CONTINUED SURVEILLANCE OF THE SITE WOULD BE REQUIRED TO INSPECT FOR LEAKING OR FALLEN DRUMS. CONTAINERS IN SERIOUSLY DETERIORATED CONDITION WOULD NEED TO BE REPACKAGED INTO NEW CONTAINERS. THE CONTINUED STORAGE OF RAW SLUDGES IN THE DSYS, IN THE CURRENT CONFIGURATION, WOULD CONSTITUTE A CONTINUING RCRA VIOLATION. EVENTUALLY THE DRUMS WOULD DETERIORATE TO THE POINT THAT THEY ALL WOULD HAVE TO BE REPLACED. AT A FUTURE DATE, ALL THE SLUDGES WOULD HAVE TO BE TREATED AND PERMANENTLY DISPOSED. THE COST AND TIME TO IMPLEMENT THIS ALTERNATIVE ARE PRESENTED BELOW:

ESTIMATED TOTAL PROJECT COST:	\$100,000
ESTIMATED ANNUAL O&M COSTS:	\$500,000/YR
ESTIMATED IMPLEMENTATION TIME:	ON GOING

7.2 ALTERNATIVE 2: DEWATERING AND STORAGE ON-SITE

ALTERNATIVE 2 INVOLVES ELIMINATING FREE LIQUIDS FROM ALL SLUDGES, REPACKAGING ALL RAW SLUDGES AND SOME OF THE PREVIOUSLY TREATED SLUDGES, AND THEN REMOVING ALL THE CONTAINERS FROM THE K-1417 DSYS AND PLACING THEM INTO RCRA COMPLIANT STORAGE IN EXISTING AND NEW BUILDINGS.

THE RAW SLUDGES WOULD BE REMOVED FROM THE EXISTING DRUMS AND TANKS AND TREATED TO LOWER THE WATER CONTENT. THE TREATMENT WOULD BE BY FILTER PRESS, THERMAL DRYING, OR A SIMILAR METHOD. THE DRY SLUDGES WOULD THEN BE REPACKAGED INTO NEW COMPATIBLE CONTAINERS, REMOVED FROM THE K-1417 DSYS, AND PLACED IN EXISTING OR NEW INDOOR STORAGE FACILITIES. THE LIQUID REMOVED FROM THE SLUDGE WOULD BE PROCESSED THROUGH EXISTING TREATMENT FACILITIES.

THE STABILIZED SLUDGE DRUMS WOULD BE OPENED AND THE FREE LIQUID IN THE CONTAINERS REMOVED BY DECANTING OR PUMPING. THE DRUMS WOULD BE INSPECTED AND DEPENDING ON THEIR CONDITION, WOULD EITHER BE REPAIRED OR OVERPACKED. THESE DRUMS WOULD ALSO BE REMOVED FROM THE PAD AND PLACED IN EXISTING OR NEW INDOOR STORAGE FACILITIES. THE LIQUID REMOVED FROM THE DRUMS WOULD BE PROCESSED THROUGH EXISTING TREATMENT FACILITIES.

THIS ALTERNATIVE WILL REQUIRE NEW STORAGE BUILDINGS TO BE BUILT TO HOUSE THE DRUMS, WITH THE REMAINDER BEING STORED WITHIN THE K-31 AND K-33 BUILDINGS. STORAGE OF SLUDGES IN THE EXISTING K-31 AND K-33 BUILDINGS WILL REQUIRE MINOR IMPROVEMENTS TO CERTAIN AREAS TO HOUSE THE DRUMS AS WELL AS APPLICATION OF PROCEDURES TO PREVENT PCB CONTAMINATION OF THE DRUMS FROM THE GASKET DRIPS WITHIN THESE BUILDINGS. AT A FUTURE DATE THE RAW SLUDGES WOULD HAVE TO BE TREATED TO MEET REGULATORY LEVELS AND THE ENTIRE SLUDGE INVENTORY PERMANENTLY DISPOSED AT ADDITIONAL COST.

ESTIMATED TOTAL PROJECT COST:	\$ 69,000,000
ESTIMATED ANNUAL O&M COSTS:	\$ 400,000/YR
ESTIMATED IMPLEMENTATION TIME:	20 MONTHS

7.3 ALTERNATIVE 3: OVERPACKING AND ONSITE STORAGE

ALTERNATIVE 3 INVOLVES OVERPACKING THE RAW SLUDGE DRUMS INTO COMPATIBLE CONTAINERS, AND MOVING THEM AND THE STABILIZED DRUMS INTO RCRA COMPLIANT STORAGE FACILITIES. THE STABILIZED SLUDGE DRUMS WOULD BE INSPECTED. DEPENDING UPON THEIR CONDITION, THEY WOULD BE OVERPACKED OR REPAIRED BEFORE BEING MOVED INTO STORAGE.

THIS ALTERNATIVE WILL REQUIRE NEW STORAGE BUILDINGS TO BE BUILT TO HOUSE THE OVERPACKED DRUMS OF RAW SLUDGE. THE STABILIZED SLUDGES WOULD HAVE THE FREE LIQUID REMOVED PRIOR TO BEING STORED WITHIN THE K-31 AND K-33 BUILDINGS. STORAGE OF SLUDGES IN THE K-31 AND K-33 BUILDINGS WILL REQUIRE MINOR IMPROVEMENTS TO CERTAIN AREAS TO HOUSE THE DRUMS AS WELL AS APPLICATION OF PROCEDURES TO PREVENT PCB CONTAMINATION OF THE DRUMS FROM THE GASKET DRIPS WITHIN THESE BUILDINGS. AT A FUTURE DATE THE RAW SLUDGES WOULD HAVE TO BE TREATED TO MEET REGULATORY LEVELS AND THE ENTIRE INVENTORY PERMANENTLY DISPOSED AT ADDITIONAL COST.

ESTIMATED TOTAL PROJECT COST:	\$65,000,000
ESTIMATED ANNUAL O&M COSTS:	\$400,000/YR
ESTIMATED IMPLEMENTATION TIME:	17 MONTHS

7.4 ALTERNATIVE 4: TREAT AND DISPOSE OFF-SITE

THIS ALTERNATIVE WOULD ENTAIL THE TREATMENT OF THE RAW SLUDGES INTO A FORM SUITABLE FOR FINAL DISPOSAL FOLLOWED BY THEIR IMMEDIATE SHIPMENT TO THE FINAL DISPOSAL SITE. THE STABILIZED SLUDGES WOULD BE DECANTED AND SHIPPED FOR DISPOSAL. THE PROJECTED METHOD OF TREATMENT FOR THE RAW SLUDGES IS UNKNOWN AT THIS TIME. OPTIONS INCLUDE CALCINING TECHNOLOGIES, ADDITIONS OF CHEMICALS TO LOWER THE SOLUBILITY OF METALS, CHEMICAL FIXATION PROCESSES, AND THERMAL FIXATION PROCESSES SUCH AS VITRIFICATION. THE GOAL OF FINAL TREATMENT IS TO PRODUCE A TREATED SLUDGE SUITABLE FOR PERMANENT DISPOSAL. TREATABILITY STUDIES TO DETERMINE THE EFFECTIVENESS OF THE PROPOSED TREATMENT METHODS WILL BE REQUIRED. THE ABILITY TO DISPOSE OF THE STABILIZED SLUDGES WITHOUT FURTHER TREATMENT IS UNKNOWN AT THIS TIME. IF FURTHER CHARACTERIZATION SHOWS THE NEED FOR MORE TREATMENT, THAN ADDITIONAL COSTS WILL BE INCURRED.

COMPLETION OF THIS ALTERNATIVE WILL ELIMINATE THE ANNUAL OPERATIONS AND MAINTENANCE COSTS FOR INSPECTIONS, REPACKAGING, BUILDING UPKEEP, ETC. ASSOCIATED WITH THE STORAGE OF DRUMS.

ESTIMATED TOTAL PROJECT COST:	\$115,000,000
ESTIMATED ANNUAL O&M COSTS:	N/A
ESTIMATED IMPLEMENTATION TIME:	30 MONTHS

7.5 ALTERNATIVE 5: TREAT AND STORE ON-SITE

THIS ALTERNATIVE IS EQUIVALENT TO ALTERNATIVE 4. HOWEVER, IT ASSUMES THAT THERE IS NO AVAILABLE DISPOSAL FACILITY FOR THE DRUMS. THIS NECESSITATES THE CONSTRUCTION OF STORAGE BUILDINGS TO HOUSE THE TREATED SLUDGE FOR AN INDEFINITE PERIOD.

ESTIMATED TOTAL PROJECT COST:	\$ 80,000,000
ESTIMATED ANNUAL O&M COSTS:	\$ 400,000/YR
ESTIMATED IMPLEMENTATION TIME:	26 MONTHS

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8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

THIS SECTION PROVIDES THE BASIS FOR DETERMINING WHICH ALTERNATIVE (1) MEETS THE THRESHOLD CRITERIA OF OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT AND COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) TO CERCLA; (2) PROVIDES THE "BEST BALANCE" BETWEEN EFFECTIVENESS AND REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT, IMPLEMENTABILITY, AND COST; AND (3) RECEIVES STATE AND COMMUNITY ACCEPTANCE. A GLOSSARY OF THE EVALUATION CRITERIA IS PROVIDED BELOW:

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT - ADDRESSES WHETHER A REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS POSED THROUGH EACH PATHWAY ARE ELIMINATED, REDUCED, OR CONTROLLED THROUGH TREATMENT, ENGINEERING CONTROLS, OR INSTITUTIONAL CONTROLS.

COMPLIANCE WITH ARARS - ADDRESSES WHETHER A REMEDY WILL MEET ALL OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER FEDERAL AND STATE ENVIRONMENTAL STATUTES AND/OR PROVIDE GROUNDS FOR INVOKING A WAIVER.

SHORT TERM EFFECTIVENESS - THE SPEED WITH WHICH THE REMEDY ACHIEVES PROTECTION AND THE REMEDY'S POTENTIAL TO CREATE ADVERSE IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT THAT MAY RESULT DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD.

LONG TERM EFFECTIVENESS AND PERMANENCE - THE MAGNITUDE OF RESIDUAL RISK AND THE ABILITY OF THE REMEDY TO MAINTAIN OVER THE LONG TERM, RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT ONCE CLEANUP GOALS HAVE BEEN MET.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT - THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES THAT MAY BE EMPLOYED IN A REMEDY.

IMPLEMENTABILITY - THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY, INCLUDING THE AVAILABILITY OF MATERIALS AND SERVICES NEEDED TO IMPLEMENT THE CHOSEN SOLUTION.

COST - INCLUDES CAPITAL AND OPERATION AND MAINTENANCE COSTS.

STATE ACCEPTANCE - INDICATES WHETHER THE STATE CONCURS WITH, OPPOSES, OR HAS NO COMMENT ON THE PROPOSED PLAN.

COMMUNITY ACCEPTANCE - THE RESPONSIVENESS SUMMARY IN THE APPENDIX OF THE INTERIM ROD REVIEWS THE PUBLIC COMMENTS RECEIVED FROM THE PUBLIC MEETING ON THE PROPOSED PLAN.

8.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

ALTERNATIVE 1, NO ACTION, HAS THE LOWEST DEGREE OF OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OF THE ALTERNATIVES BECAUSE IT WOULD ALLOW THE CONTINUED EXPOSURE OF THE DRUMS TO THE ENVIRONMENT, LEADING TO THEIR FURTHER DETERIORATION AND CONSEQUENT CHRONIC OR CATASTROPHIC RELEASE OF THEIR CONTENTS. ALSO, UNDER ALTERNATIVE 1 THE SAFETY HAZARD TO WORKERS RESPONSIBLE FOR SITE INSPECTION AND MAINTENANCE WOULD INCREASE AS THE CONDITION OF THE DRUMS WORSENE.

ALTERNATIVE 2, DEWATERING AND STORAGE ON-SITE, OFFERS A MODERATE DEGREE OF OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. IT REMOVES THE DRUMS FROM THE K-1417 DSYS AND PLACES THEM INTO INSIDE STORAGE, ISOLATED FROM THE ENVIRONMENT IN A RELATIVELY SHORT TIME FRAME. HOWEVER, SIGNIFICANT PROCESSING AND HANDLING WILL BE REQUIRED AT THE TIME THE ALTERNATIVE IS IMPLEMENTED AND AGAIN AT A FUTURE DATE FOR FINAL DISPOSAL.

ALTERNATIVE 3 OFFERS A MODERATE DEGREE OF OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. IT REMOVES THE DRUMS FROM THE K-1417 DSYS AND PLACES THEM INTO INDOOR STORAGE UNITS IN A RELATIVELY SHORT TIME FRAME. HOWEVER, HANDLING OF THE DRUMS WILL BE REQUIRED AT THE

TIME THE ALTERNATIVE IS IMPLEMENTED AND SIGNIFICANT HANDLING OF THE SLUDGES WILL BE REQUIRED AT A FUTURE DATE FOR FINAL DISPOSAL.

ALTERNATIVES 4 AND 5 EACH OFFER A MODERATE DEGREE OF OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. SIGNIFICANT HANDLING AND PROCESSING OF THE WASTES INCREASES THE POTENTIAL FOR EXPOSURE TO PEOPLE AND THE ENVIRONMENT. ALL SLUDGES WOULD REMAIN ON THE DSYS UNTIL TREATMENT IS UNDERWAY. IN THE INTERIM, THE DRUMS WOULD CONTINUE TO DETERIORATE. TREATMENT WOULD REDUCE THE MOBILITY OF WASTE CONSTITUENTS AND THE TREATED MATERIAL WOULD BE PLACED INTO A SECURE LONG TERM REPOSITORY FOLLOWING TREATMENT.

COMPLIANCE WITH ARARS

SINCE THERE IS NO EVIDENCE OF CONTAMINATED GROUNDWATER, SURFACE WATER, OR SOILS, THERE ARE NO CHEMICAL SPECIFIC CLEANUP STANDARDS FOR THE K-1417 DSYS. HOWEVER, THE POTENTIAL EXISTS FOR THE CONTAMINATION OF SURFACE WATERS TO LEVELS EXCEEDING WATER QUALITY CRITERIA IF THE SLUDGES ARE LEFT ON THE YARD FOR AN EXTENDED TIME PERIOD. THE ONLY OTHER CHEMICAL SPECIFIC ARARS IDENTIFIED ARE THE RCRA LAND DISPOSAL RESTRICTIONS (LDR) TREATMENT STANDARDS FOR F006 MIXED WASTES. ACTION SPECIFIC ARARS INCLUDE RCRA AND TENNESSEE HAZARDOUS WASTE TREATMENT AND STORAGE REGULATIONS.

ALTERNATIVE 1 WOULD RESULT IN CONTINUED VIOLATIONS OF RCRA AND TENNESSEE CONTAINER STORAGE REGULATIONS FOR HAZARDOUS WASTE. THIS ALTERNATIVE COULD RESULT IN WATER QUALITY CRITERIA VIOLATIONS IN THE FUTURE AND DOES NOT MEET THE LDR REQUIREMENTS. CONTINUED STORAGE OF SLUDGES WHICH DO NOT MEET THE LDR REQUIREMENTS WILL REQUIRE A LDR VARIANCE AND/OR INCLUSION OF THE SLUDGES IN THE COMPLIANCE AGREEMENT FOR LDR WASTES WHICH IS PRESENTLY BEING NEGOTIATED.

ALTERNATIVE 2 WOULD BE IN COMPLIANCE WITH RCRA AND TENNESSEE HAZARDOUS WASTE STORAGE REGULATIONS UPON COMPLETION, HOWEVER, THE RAW SLUDGES WILL NOT COMPLY WITH THE LDR REQUIREMENTS. CONTINUED STORAGE OF SLUDGES WHICH DO NOT MEET THE LDR REQUIREMENTS WILL REQUIRE A LDR VARIANCE AND/OR INCLUSION OF THE SLUDGES IN THE COMPLIANCE AGREEMENT FOR LDR WASTES WHICH IS PRESENTLY BEING NEGOTIATED. ADDITIONAL TESTING IS REQUIRED TO DETERMINE IF THE STABILIZED SLUDGES CAN MEET LDR TREATMENT STANDARDS. RCRA REQUIREMENTS RELATED TO TREATMENT WOULD BE MET DURING THE DEWATERING.

ALTERNATIVE 3 WOULD BE IN COMPLIANCE WITH RCRA AND TENNESSEE HAZARDOUS WASTE STORAGE REGULATIONS UPON COMPLETION, HOWEVER, THE RAW SLUDGES WILL NOT COMPLY WITH THE LDR REQUIREMENTS. CONTINUED STORAGE OF SLUDGES WHICH DO NOT MEET THE LDR REQUIREMENTS WILL REQUIRE A LDR VARIANCE AND/OR INCLUSION OF THE SLUDGES IN THE COMPLIANCE AGREEMENT FOR LDR WASTES WHICH IS PRESENTLY BEING NEGOTIATED. ADDITIONAL TESTING IS REQUIRED TO DETERMINE IF THE STABILIZED SLUDGES CAN MEET LDR TREATMENT STANDARDS.

ALTERNATIVES 4 AND 5 WOULD BE IN COMPLIANCE WITH RCRA AND TENNESSEE HAZARDOUS WASTE DISPOSAL OR STORAGE REGULATIONS UPON COMPLETION. COMPLIANCE WITH THE RCRA LDR REQUIREMENTS FOR STORAGE AND DISPOSAL WOULD BE MET FOR THE TREATED RAW SLUDGES. ADDITIONAL TESTING IS REQUIRED TO DETERMINE IF THE STABILIZED SLUDGES CAN MEET LDR TREATMENT STANDARDS. RCRA REQUIREMENTS RELATED TO TREATMENT WOULD BE MET DURING THE TREATMENT.

8.3 SHORT TERM EFFECTIVENESS

ALTERNATIVE 1 REPRESENTS THE STATUS QUO AND DOES NOTHING TO REDUCE RISKS TO HUMAN HEALTH OR THE ENVIRONMENT OVER THE SHORT-TERM.

ALTERNATIVE 2, DEWATERING AND ON-SITE STORAGE, HAS THE SECOND HIGHEST DEGREE OF SHORT-TERM EFFECTIVENESS AMONG THE ACTION ALTERNATIVES BECAUSE IT ALLEVIATES SITE PROBLEMS IN A SHORT TIME FRAME (20 MONTHS), HOWEVER IT REQUIRES SIGNIFICANT HANDLING OF THE RAW SLUDGES.

ALTERNATIVE 3, OVERPACKING, AND ON-SITE STORAGE, HAS THE HIGHEST SHORT-TERM EFFECTIVENESS AMONG THE ACTION ALTERNATIVES BECAUSE IT ALLEVIATES THE SITE PROBLEMS IN THE SHORTEST TIME PERIOD (17 MONTHS) AND REQUIRES THE LEAST AMOUNT OF HANDLING OF THE SLUDGES.

ALTERNATIVES 4 AND 5, TREAT AND DISPOSE OR STORE, EACH HAVE A MODERATE LEVEL OF SHORT-TERM EFFECTIVENESS DUE TO IMPLEMENTATION TIME (26-30 MONTHS) BUT ALLOW WASTE TO REMAIN IN DETERIORATING DRUMS ON THE DSYS UNTIL TREATMENT IS COMPLETED.

8.4 LONG TERM EFFECTIVENESS AND PERMANENCE

ALTERNATIVE 1, NO ACTION, DOES NOT REDUCE SITE RISKS AND THEREFORE IS NOT PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT OVER THE LONG-TERM BECAUSE OF THE CONTINUED EXPOSURE OF THE ENVIRONMENT TO THE SLUDGES. THIS COULD EVENTUALLY LEAD TO CONTAMINATION OF THE SURFACE WATERS IN THE VICINITY OF THE DSYS. ADDITIONALLY, THERE IS A CONTINUING RISK OF EXPOSURE TO THE WORKERS, AND A CHANCE FOR INJURIES, DUE TO THE NEED TO CONTINUALLY ACCESS THE STORAGE YARDS TO MAINTAIN THE DRUMS. ALTERNATIVE 1 IS NOT A PERMANENT SOLUTION TO THE PROBLEM. THE SLUDGES WILL REQUIRE FINAL TREATMENT AND DISPOSAL AT SOME FUTURE DATE.

ALTERNATIVE 2, DEWATERING AND STORAGE ON-SITE, HAS A MODERATE DEGREE OF LONG-TERM EFFECTIVENESS THE MOBILITY OF THE CONTAMINANTS IS REDUCED BY REMOVING THE LIQUIDS FROM THE SLUDGES ALSO, THE CHANCE FOR WASTE CONSTITUENTS TO BE RELEASED TO THE ENVIRONMENT IS REDUCED BY PLACING THE RAW SLUDGES INTO COMPATIBLE CONTAINERS AND ALL THE DRUMS INTO INDOOR STORAGE. THERE IS A MODERATE RISK TO WORKERS REMAINING BECAUSE THE STORAGE AREA WILL NEED TO BE INSPECTED AND DETERIORATED. CONTAINERS REPLACED. SINCE THE STABILIZED DRUMS ARE NOT OVERPACKED THERE IS A CONTINUED CHANCE FOR FAILURE OF THESE CONTAINERS. THIS ALTERNATIVE IS NOT A PERMANENT SOLUTION TO THE PROBLEM BECAUSE THE SLUDGES WILL REQUIRE FINAL TREATMENT AND DISPOSAL AT SOME FUTURE DATE.

ALTERNATIVE 3, OVERPACKING AND ON-SITE STORAGE, HAS A MODERATE TO LOW DEGREE OF LONG TERM EFFECTIVENESS. THE CHANCE FOR A RELEASE TO THE ENVIRONMENT IS REDUCED BY PLACING THE RAW SLUDGE DRUMS INTO OVERPACK CONTAINERS AND THEN INTO INSIDE STORAGE. THERE IS A MODERATE RISK TO WORKERS REMAINING BECAUSE THE STORAGE AREA WILL NEED TO BE INSPECTED AND DETERIORATED CONTAINERS REPLACED. SINCE THE STABILIZED DRUMS ARE NOT OVERPACKED THERE IS A CONTINUED CHANCE FOR FAILURE OF THESE CONTAINERS. THIS ALTERNATIVE IS NOT A PERMANENT SOLUTION TO THE PROBLEM BECAUSE FINAL TREATMENT AND DISPOSAL WOULD STILL BE REQUIRED AT SOME FUTURE DATE.

ALTERNATIVE 4, TREAT AND DISPOSE OFF-SITE, OFFERS THE HIGHEST LONG-TERM EFFECTIVENESS. THE CHANCE FOR AN ENVIRONMENTAL RELEASE IS NEGLIGIBLE BECAUSE THE WASTES ARE TREATED INTO A NON-LEACHABLE, IMMOBILE FORM. THERE ARE NO LONG-TERM HUMAN HEALTH RISKS REMAINING AT THE SITE BECAUSE THE DRUMS ARE PLACED INTO THEIR FINAL DISPOSAL SITE. THIS ALTERNATIVE IS CONSIDERED A PERMANENT SOLUTION TO THE SLUDGES.

ALTERNATIVE 5, TREAT AND STORE ON-SITE, HAS SLIGHTLY HIGHER LONG-TERM EFFECTIVENESS THAN ALTERNATIVE 2, BECAUSE THE SLUDGES ARE TREATED TO A FINAL FORM. THERE IS A MODERATE RISK TO WORKERS REMAINING BECAUSE THE STORAGE AREA WILL NEED TO BE INSPECTED AND DETERIORATED CONTAINERS REPLACED. SINCE THE STABILIZED DRUMS ARE NOT OVERPACKED THERE IS A CONTINUED CHANCE FOR FAILURE OF THESE CONTAINERS. THIS ALTERNATIVE IS NOT A PERMANENT SOLUTION TO THE PROBLEM BECAUSE THE SLUDGES WILL REQUIRE FINAL DISPOSAL AT SOME FUTURE DATE. ALSO IF THE STABILIZED SLUDGES DO NOT MEET THE DISPOSAL CRITERIA AT THE TIME OF FINAL DISPOSAL, THAN ADDITIONAL TREATMENT WILL NEED TO BE PROVIDED.

8.5 REDUCTION OF TOXICITY, MOBILITY, AND VOLUME BY TREATMENT

ALTERNATIVE 1, NO ACTION DOES NOT REDUCE THE TOXICITY, MOBILITY, OR VOLUME OF THE CONTAMINANTS OR SLUDGES.

ALTERNATIVE 2, DEWATER AND STORAGE ON-SITE, WILL REDUCE THE MOBILITY OF THE CONTAMINANTS BUT NOT THE TOXICITY OR VOLUME. THE MOBILITY IS REDUCED THROUGH THE REMOVAL OF THE FREE LIQUIDS FROM ALL THE SLUDGES. SOME VOLUME REDUCTION WILL BE POSSIBLE THROUGH DEWATERING THE RAW SLUDGES, BUT IT IS NOT EXPECTED TO BE SIGNIFICANT. SINCE THE ONLY TREATMENT BEING PROVIDED IS THE REMOVAL OF THE FREE LIQUIDS, THERE IS NO REDUCTION OF THE TOXICITY OF THE CONTAMINANTS IN THE SLUDGES. ALSO, SINCE TREATMENT OF THE RAW SLUDGE IS NOT PROVIDED, THE CONTAMINANTS MORE MOBILE THAN IN THE OTHER ACTION ALTERNATIVES.

ALTERNATIVES 3, OVERPACK AND STORAGE ON-SITE, WILL NOT REDUCE THE MOBILITY, TOXICITY OR VOLUME OF THE SLUDGES. SINCE FINAL TREATMENT OF THE RAW SLUDGE IS NOT PROVIDED, THE CONTAMINANTS REMAIN MORE MOBILE THAN IN THE OTHER ACTION ALTERNATIVES.

ALTERNATIVES 4 AND 5 INCLUDE TREATMENT TO REDUCE THE MOBILITY OF THE CONTAMINANTS, BUT NOT THE TOXICITY. THE VOLUME OF SLUDGE WILL LIKELY INCREASE DUE TO THE TREATMENT PROCESS.

8.6 IMPLEMENTABILITY

THE DESIGN AND ENGINEERING REQUIREMENTS FOR ALTERNATIVE 1 ARE THE LEAST OF ANY OF THE ALTERNATIVES. THE ONLY TECHNICAL REQUIREMENT IS TO OVERPACK CONTAINERS FOUND BY THE INSPECTIONS TO BE READY TO FAIL. HOWEVER, THIS TASK WOULD BECOME INCREASINGLY DIFFICULT WITH TIME AS CONTAINERS FAIL AT A HIGHER RATE. ALTERNATIVE 1 IS NOT ADMINISTRATIVELY FEASIBLE BECAUSE THE REGULATORS (TDEC AND EPA) WILL NOT ALLOW THE OUTSTANDING RCRA VIOLATIONS TO CONTINUE INDEFINITELY.

ALTERNATIVE 2, DEWATER AND STORAGE ON-SITE, IS THE THIRD EASIEST TO IMPLEMENT, AND ALMOST AS EASY AS ALTERNATIVE 3. DEWATERING METHODS ARE READILY AVAILABLE AND FAIRLY EASY TO IMPLEMENT. THE DESIGN AND CONSTRUCTION OF THE NEW STORAGE BUILDINGS IS STRAIGHT FORWARD AND UPGRADING OF EXISTING SPACE WILL NOT BE DIFFICULT.

ALTERNATIVE 3 IS THE SECOND EASIEST TO IMPLEMENT. THE DESIGN AND CONSTRUCTION OF THE NEW STORAGE BUILDINGS IS STRAIGHT FORWARD AND UPGRADING OF EXISTING SPACE WILL NOT BE DIFFICULT. DESIGN OF THE NEW BUILDINGS FOR ALTERNATIVE 3 WILL BE MORE EXTENSIVE THAN FOR ALTERNATIVE 2 OR 5 BECAUSE SECONDARY CONTAINMENT DESIGN REQUIREMENTS TO STORE LIQUIDS WOULD HAVE TO BE MET.

DECIDING ON A FINAL TREATMENT METHOD IS THE MOST DIFFICULT PART OF IMPLEMENTING ALTERNATIVES 4 OR 5. THIS WILL REQUIRE TREATABILITY STUDIES AND A STRINGENT QUALITY CONTROL PROGRAM TO ASSURE A SUITABLE FINAL WASTE FORM. PRESENTLY, ALTERNATIVE 4 IS NOT ADMINISTRATIVELY FEASIBLE BECAUSE THERE IS NO DISPOSAL SITE IN THE COUNTRY THAT CAN ACCEPT THE K-1417 SLUDGES. HOWEVER, THAT SITUATION MAY CHANGE IN THE NEAR FUTURE.

ANOTHER SET OF ADMINISTRATIVE REQUIREMENTS THAT WOULD APPLY TO ALL OF THE ALTERNATIVES ARE RCRA PERMITTING STANDARDS FOR TREATMENT AND STORAGE OF HAZARDOUS WASTE. BECAUSE THE INTERIM CORRECTIVE ACTION WILL TAKE PLACE AT AN EXISTING RCRA INTERIM STATUS FACILITY, TREATMENT MAY BE PERFORMED AND CONTAINER STORAGE CAPACITY EXPANDED UNDER A CHANGE TO INTERIM STATUS, SUBJECT TO TDEC APPROVAL. ULTIMATELY, ANY NEW, PERMANENT STORAGE OR TREATMENT UNITS WILL REQUIRE PERMITS. THE EXISTING K-1417 DSYS CANNOT BE PERMITTED UNLESS SUBSTANTIAL IMPROVEMENTS ARE MADE.

8.7 COST

THE COMPARATIVE ANALYSIS OF COSTS CONSIDERS ONLY DIFFERENCES IN CAPITAL, OPERATION AND MAINTENANCE, AND TOTAL ESTIMATED COSTS. COSTS FOR EACH ALTERNATIVE HAVE BEEN PROVIDED IN SECTION 5 OF THIS PLAN. THE COSTS PROVIDED IN SECTION 5 ONLY COVER THE INTERIM ACTION PROPOSED IN EACH ALTERNATIVE. SOME OF THE ALTERNATIVES WILL ENTAIL ADDITIONAL COSTS AT A FUTURE DATE TO PERMANENTLY TREAT AND/OR DISPOSE OF THE SLUDGES. LIKEWISE, COSTS OF PENALTIES FOR HAZARDOUS

WASTE MANAGEMENT. VIOLATIONS ARE NOT INCLUDED IN THIS ANALYSIS.

ALTERNATIVE 1, NO ACTION, IS THE LOWEST COST ALTERNATIVE DUE TO THE LIMITED NATURE OF THE RESPONSE. ALTERNATIVE 2 AT \$69 MILLION AND ALTERNATIVE 3 AT 65 MILLION ARE THE LOWEST COST ALTERNATIVES WHICH ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. ALTERNATIVE 4, TREAT AND DISPOSE OFF-SITE, AT \$115 MILLION IS THE ONLY ALTERNATIVE WHICH PROVIDES FOR FINAL RESOLUTION OF THE PROBLEM AND THEREFORE, MAY BE THE MOST COST-EFFECTIVE REMEDY OVER THE LONG-TERM. ALTERNATIVE 5 AT 80 MILLION, ALONG WITH ALTERNATIVES 2 AND 3, STABILIZE THE SITUATION BUT DO NOT REFLECT FUTURE DISPOSAL COSTS. HOWEVER ALTERNATIVE 5 PROVIDES A MORE STABLE WASTE FORM.

8.8 STATE ACCEPTANCE

THE STATE OF TENNESSEE, AS REPRESENTED BY THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, DOE OVERSIGHT DIVISION, CONCURS IN THE SELECTION OF ALTERNATIVE 2 AS AN INTERIM ACTION FOR THE DSYS.

8.9 COMMUNITY ACCEPTANCE

BASED ON COMMENTS MADE BY CITIZENS AT THE PUBLIC MEETING HELD ON SEPTEMBER 9, 1991 AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD, THE DOE PERCEIVES THAT THE COMMUNITY BELIEVES THE INTERIM ACTION WILL EFFECTIVELY PROTECT HUMAN HEALTH AND THE ENVIRONMENT.

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9. THE SELECTED REMEDY

BASED UPON CONSIDERATION OF THE REQUIREMENTS OF CERCLA, THE DETAILED ANALYSIS OF THE ALTERNATIVES, AND THE PUBLIC COMMENTS, DOE HAS DETERMINED THAT ALTERNATIVE 2, DEWATERING AND STORAGE ON-SITE, IS AN APPROPRIATE INTERIM ACTION UNTIL FINAL ACTION FOR THE DSYS AREA IS DETERMINED. BASED ON CURRENT INFORMATION, THIS ALTERNATIVE PROVIDES THE BEST BALANCE WITH RESPECT TO THE NINE CRITERIA USED TO EVALUATE THE ALTERNATIVES.

THE GOAL OF THIS INTERIM ACTION IS TO PREVENT OR MITIGATE THE IMMINENT THREAT OF RELEASE OF CONTAMINANTS TO THE SURROUNDING ENVIRONMENT AND TO MINIMIZE THE THREAT TO HUMAN HEALTH. AN ADDITIONAL GOAL OF THIS INTERIM ACTION IS TO ASSURE THAT THE SLUDGES ARE MANAGED IN COMPLIANCE WITH THE REQUIREMENTS OF RCRA. REMOVAL OF THE LIQUIDS FROM THE SLUDGES, REPAIR OF THE STABILIZED SLUDGE DRUMS, AND REMOVAL OF ALL THE DRUMS FROM THE DSYS WILL ADDRESS ALL THE CONCERNS AT THE SITE.

THE PROPOSED INTERIM ACTION FOR THE K-1417 DSYS IS NOT THE FINAL ACTION PLANNED FOR THE DSYS BECAUSE SUCH GOALS ARE BEYOND THE SCOPE OF THIS LIMITED ACTION. SUBSEQUENT ACTIONS ARE PLANNED TO ADDRESS FULLY THE PRINCIPAL THREATS POSED BY THE CONDITIONS AT WAG 1 AND OTHER IDENTIFIED WAGS A K-25. THESE ACTIONS WILL BE DEFINED AS THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDIES ARE COMPLETED FOR THE K-25 WAGS.

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10. STATUTORY REQUIREMENTS

THE DOE BELIEVES THAT THE REMOVAL OF LIQUIDS FROM THE SLUDGES AND REMOVAL OF THE DRUMS FROM THE DSYS WILL SATISFY THE STATUTORY REQUIREMENTS PROVIDING PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. THE SELECTED REMEDY'S COMPLIANCE WITH THE STATUTORY REQUIREMENTS IS SUMMARIZED BELOW.

10.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY PROTECTS HUMAN HEALTH AND THE ENVIRONMENT BY REMOVING ALL THE SLUDGES FROM THE DSYS, ASSURING THE INTEGRITY OF ALL THE CONTAINERS, AND BY PLACING ALL THE CONTAINERS INTO RCRA COMPLIANT STORAGE FACILITIES.

10.2 ATTAINMENT OF THE APPLICABLE OR RELEVANT ID APPROPRIATE REQUIREMENTS

ALTERNATIVE 2 WOULD BE IN COMPLIANCE WITH RCRA AND TENNESSEE HAZARDOUS WASTE STORAGE REGULATIONS UPON COMPLETION AS WELL AS THE TENNESSEE WATER POLLUTION CONTROL REGULATIONS. RCRA REQUIREMENTS RELATED TO TREATMENT WOULD BE MET DURING THE DEWATERING. HOWEVER, THE RAW SLUDGES WILL NOT COMPLY WITH THE LDR REQUIREMENTS FOR STORAGE. CONTINUED STORAGE OF SLUDGES WHICH DO NOT MEET THE LDR REQUIREMENTS WILL REQUIRE A LDR VARIANCE AND/OR INCLUSION OF THE SLUDGES IN THE COMPLIANCE AGREEMENT FOR LDR WASTES WHICH IS PRESENTLY BEING NEGOTIATED. ADDITIONAL TESTING IS REQUIRED TO DETERMINE IF THE STABILIZED SLUDGES CAN MEET LDR TREATMENT STANDARDS.

10.3 COST EFFECTIVENESS

THE INTERIM ACTION REMEDY EMPLOYS A PROVEN TECHNOLOGY AND AFFORDS OVERALL EFFECTIVENESS PROPORTIONAL TO ITS COSTS SUCH THAT THE REMEDY REPRESENTS A REASONABLE VALUE FOR THE MONEY.

10.4 UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

THE OBJECTIVES OF THIS INTERIM ACTION ARE TO MITIGATE THE POTENTIAL RELEASES OF HAZARDOUS SUBSTANCES, ELIMINATE THE THREAT TO HUMAN HEALTH, AND TO MANAGE THE SLUDGES IN COMPLIANCE WITH THE HAZARDOUS WASTE REGULATIONS. REMOVAL OF LIQUIDS FROM THE SLUDGES AND PLACING THE CONTAINERS INTO RCRA COMPLIANT FACILITIES WILL ACHIEVE THESE GOALS. THIS IS NOT THE FINAL ACTION PLANNED FOR THIS SITE OR THE SLUDGES AND DOE WILL CONTINUE TO EVALUATE LONG TERM EFFECTIVENESS AND PERMANENCE AS PART OF THE DEVELOPMENT OF THE FINAL ACTION FOR THE SLUDGES AND THE DSYS.

10.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

THIS IS NOT THE FINAL ACTION FOR THE DISPOSITION OF THE SLUDGES. HOWEVER, THE REMEDY UTILIZES LIMITED TREATMENT (REMOVAL OF FREE LIQUIDS) TO REDUCE THE MOBILITY OF THE CONTAMINANTS. THIS LEVEL OF TREATMENT IS APPROPRIATE FOR THE LIMITED INTERIM ACTION.

10.6 DOCUMENTATION OF SIGNIFICANT CHANGES

THE PROPOSED PLAN FOR THE DSYS WAS RELEASED FOR PUBLIC COMMENT ON AUGUST 16, 1991, AND IDENTIFIED DEWATERING OF THE SLUDGES AND STORAGE ON-SITE AS THE PREFERRED INTERIM ACTION ALTERNATIVE. DOE REVIEWED ALL WRITTEN AND VERBAL COMMENTS SUBMITTED DURING THE PUBLIC COMMENT PERIOD. UPON REVIEW OF THESE COMMENTS, IT WAS DETERMINED THAT NO SIGNIFICANT CHANGES TO THE ALTERNATIVE, AS IT WAS ORIGINALLY IDENTIFIED IN THE PROPOSED PLAN, WERE NECESSARY.